Winning Hearts and Minds through Development Aid: Evidence from a Field Experiment in Afghanistan[1]

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Abstract:

Development programs have been increasingly used not only as an instrument for economic and political development, but also as a tool for counterinsurgency. This strategy presumes that reliable delivery of goods and services can secure support for an embattled government, sway the population away from the rebels, and reduce violence. We test this presumption in the context of Afghanistan. Using a large-scale randomized field experiment we examine the effect of the largest development program in that war-torn country. The results suggest that the strategy is working. We find that the introduction of this government-led program leads to significant improvement in villagers' economic wellbeing as well as in their attitudes towards the government. Apart from a change in perceptions and attitudes, the program also leads to an improved security situation in the long run. These positive effects on attitudes and security, however, are not observed in districts with high levels of initial violence.

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I. Introduction

Development programs have long been used to promote economic and political development. In recent years, however, they have assumed yet another role: they have been used to promote security in countries fighting raging insurgencies, such as Afghanistan and Iraq. The approach of development aid as a counterinsurgency tool presumes that once people observe that the public goods and services provided by the government (or by a foreign military that backs the government) improve their economic situation, they become supportive of the government and less likely to help or join the insurgents, in turn, leading to a reduction in violence. The concept of development aid provision as a counterinsurgency strategy has become so influential that it now constitutes an important ingredient of the new U.S. counterinsurgency doctrine which is premised on winning the population's "hearts and minds" (U.S. Army/Marine Corps, 2006).

Despite the increasingly important role that development projects have played in counterinsurgency efforts, there is very limited empirical evidence to assess the effectiveness of this strategy. In this paper we use results from a large-scale randomized field experiment in Afghanistan to test all three stages in the proposed mechanism of development as a tool for counterinsurgency—namely, that development programs improve people's economic well-being, which results in improved attitudes towards the government, which, in turn, leads to improvements in security. We show that Afghanistan's National Solidarity Program (NSP) —the largest development program in Afghanistan — improves villagers' economic wellbeing as well as their attitudes towards the government. There is also evidence that the program has led to a notable improvement in security. The effect on attitudes and security, however, is limited to regions with moderate levels of initial violence.

Internal armed conflicts are at the root of global development problems. Between 1960 and 2010 more than half of the world's countries were affected by civil conflict with twenty percent of them having been at war for at least ten years (Blattman and Miguel, 2010). Civil conflicts result not only in loss of lives and physical destruction, but also have in significant deterioration in investment in physical (Collier, 1999) and human (Sánchez, 2010) capital. Thus, development programs that help to prevent or at least ameliorate civil conflicts have a major effect on improving people's lives that goes far beyond the provision of basic services.

Insurgencies are a particular type of civil armed conflict. They usually involve an embattled government facing attacks from a group that uses guerilla tactics to achieve the political goal of overthrowing that government or of seizing and governing a breakaway territory (Iyengar and Monten, 2008).[2] Insurgencies therefore tend to be asymmetrically fought, although the fighting could turn into a more conventional military conflict once the insurgent groups gain strength relative to government forces. Counterinsurgency, in turn, refers to all military, political, and economic actions taken by the challenged government or its supporters to defeat the insurgency. Development programs can be part of a counterinsurgency strategy if aimed at undermining the insurgency through increased support for the government.

Two recent studies that look at the effect of development programs on the level of violence in countries affected by insurgency have come up with conflicting results. Berman, Shapiro and Felter (2009) analyze the effects on security of reconstruction funds allocated through a development program run by the U.S. military in Iraq. They find that increased spending led to a decrease in violence, although only after a significant increase in troop strength in 2007. Crost and Johnston (2010) examine the effect of a development assistance program in the Philippines. They show that the program actually exacerbated violence in the short-run, and had no effect in the long-run.

One of the main challenges in the empirical analysis of the effect of development aid on security is the non-random assignment of aid. Selection bias can lead to either an upward or a downward bias depending on the context. If the delivery of aid was determined by the ease of access and safety of the personnel, development funds would be delivered to relatively safe regions, leading to a spurious negative relationship between aid and the level of violence. On the other hand, if aid was purposely targeted into the areas which are more vulnerable because of high insecurity, that would lead to a spurious positive relationship between aid and violence. The two aforementioned papers employ different empirical strategies to address these issues. Berman, Shapiro and Felter (2009) carefully control for region-specific characteristics and preexisting trends in violence, whereas Crost and Johnston (2010) employ a regression discontinuity design.

[2] Alternative but closely related definitions of insurgency can be found in Fearon and Laitin (2003) or in the US counterinsurgency manual (U.S. Army/Marine Corps, 2006).

Our study differs from these existing works in two important ways. First, we use a randomized field experiment to deal with the problem of selection bias. Specifically, out of 500 villages in our sample, half were randomly assigned to receive a community driven development program in 2007, whereas the other half of the villages will receive the program in late fall of 2011. Random assignment ensures that the results are not driven by selection bias and that they actually capture the causal impact of the development program. Second, in addition to events data on security incidents, we use survey data collected in the field, which provide measures of perceptions as well as attitudes of the civilian population. This allows us to test the specific mechanisms through which development programs affect the underlying security situation.

If NSP is an effective counterinsurgency tool, we expect that to be reflected in improved perceptions' of an individual's wellbeing (because of improvement or at least perception of improvement in access to services and socioeconomic conditions) as well as an improvement in individuals' attitudes towards the government (be it on the local or central level). Specifically, we would expect that in villages that receive development aid, villagers will have more positive perceptions of their economic situation broadly defined, which would lead to better attitudes towards the government, which would, in turn, lead to lower levels of violence.

Our findings indicate that NSP has a strong positive effect on people's economic wellbeing and on their attitudes towards the Afghan government (both on the central and local level). NSP also appears to improve the attitudes toward NGOs and, to some extent, coalition forces on the ground. These changes in attitudes and perceptions point to a positive direction in the battle for hearts and minds. The results also indicate that villagers have more positive perceptions about security in NSP villages. There is also evidence that the program reduces the number of security incidents recorded by coalition forces in the long run (more than a year after the start of the program). There is no evidence, however, that the program affects the number of security incidents recorded by NATO coalition forces (International Security Assistance Force-ISAF) in the short run or the number of security incidents reported by villagers in the survey. Notably, in the two eastern districts in which the level of violence is considerably higher as compared with the other eight districts included in the study, we don't observe those markedly positive results on attitudes toward the government and on security. Thus, our results suggest that buying "hearts and minds" through development programs can be successful in preventing the spread of violence, but is less successful in reducing violence in regions that already suffer from high levels of insecurity.

Empirical results provide evidence in favor of theories of civil conflict that treat insurgents as rational actors that respond to economic incentives, rather than fanatics whose motivation is determined solely by ethnic, religious or ideological bonds. In this framework the level of violence to a large extent depends on popular support for the insurgency, since it determines both the number of people willing to join the insurgency, and the amount of information about the insurgency that the general population is willing to share with government agents. Our results prove fully consistent with the "hearts and minds" theory that presumes that popular support is determined by the successful provision of public goods. Some of the results are also consistent with the opportunity cost theory of conflict that emphasizes the costs of joining the insurgency as the main determinant of violence. Our results, however, are not consistent with theories that focus on the amount of material resources to be captured as the main determinant of violence.

The paper is divided into eight sections. Section II describes the relevant literature. Section III provides a description of NSP and the randomized impact evaluation of the program. Section IV presents the relevant hypotheses. Section V presents the data sources. Section VI describes the methodology and results of the empirical analysis, which are then further discussed in Section VII. Section VIII concludes.

II. Literature Review

The body of social science work on internal conflicts to-date has focused on civil wars as a whole rather than just on insurgencies (see Blattman and Miguel, 2010 for a review). The recent wars in Iraq and Afghanistan have however led to a surge in the study of counterinsurgency, which looks only at the specified subset of largely irregular and asymmetrically fought civil wars. A number of works have looked at counterinsurgency success or failure by examining levels of mechanization (Lyall and Wilson, 2009), levels of manpower (Friedman, 2010), violence (Lyall, 2009; Kalyvas, 2006), the role of ethnicity (Lyall, 2010), interaction of strategies between state and insurgents (Arreguin-Toft, 2001), in-state counterinsurgency campaigns (Lalwani, 2010), and the use of foreign military aid (Dube and Naidu, 2010). What the literature suggests so far is that the number of boots on the ground is not a decisive determinant of counterinsurgency outcomes; increasing levels of mechanization appear to have an adverse effect on counterinsurgency; co-ethnics make for better counterinsurgents than external forces; and foreign military assistance may strengthen armed non-

state actors. Findings diverge on whether a state's use of indiscriminate violence incites more insurgent attacks or whether it curtails them.

Recent discussions on counterinsurgency both in policy and academia have been highly influenced by the U.S. counterinsurgency manual (U.S. Army/Marine Corps, 2006). Largely informed by doctrines developed to address communist or anti-colonialist revolutionary movements (Kalyvas, 2008), the manual rests upon specific assumptions about the type of insurgency fought and the relationship between the host government and the outside intervener. Specifically, the government is seen as a legitimate actor that represents the general wellbeing of the state's population and needs to be supported by the external intervener since its power is under threat. It also presumes that basic security and public goods' provision can turn people away from the insurgency and into the ranks of the government, while remaining agnostic to other non-instrumental bonds (such as ideological or ethnic) that the insurgents may have to the people (Kalyvas, 2008).

Theories of Civil Conflict

Theories of internal armed conflict can be broadly divided into two types (Blattman and Miguel, 2010). The first type treats warring groups as unitary actors, whereas the second type looks at the incentives of individual agents to join and support different warring groups during the conflict. The latter class of models is the most relevant for the analysis of counterinsurgency, as it directly concerns the factors that affect the willingness of the population to support either the insurgents or the government.

We can distinguish several types of theoretical models that outline the micro-foundations for insurgency. These theories, which are not mutually exclusive, capture different motivations that are likely to operate at the same time, but in some cases make different predictions on the effect of development programs on security so that empirical results can provide evidence on the relative importance of different theories.

According to the "greed" theory of conflict (e.g. Collier and Hoeffler 1998, 2004; Grossman, 1999) insurgents are driven by purely economic motivations for capturing material resources controlled by the government. According to this approach an increase in the amount of contested resources increases conflict risk, since it offers stronger incentives for the insurgents to fight. In particular, government-controlled development programs would lead to an increase in violence, as the insurgents would attempt to capture the resources provided by such programs.

"Bargaining models" (Fearon, 1995; Powell 2004, 2006) are very close to the greed theory of conflict in their focus on capturing material resources as the main motivation for the insurgents, but they argue that violence occurs only when the conflicting parties fail to negotiate a peaceful division of resources. Thus, violence would result from an increase in information asymmetry caused by a power shift among warring groups or a by a change in the value of contested resources. Development programs may affect both the value of resources and the balance of power, but the assessment of the size of the effect might be different for the insurgents than for the government. Thus, according to the bargaining model approach, development programs increase violence, but the effect is likely to be observed only in the short-run, as the warring parties are likely to negotiate a new bargain (Crost and Johnston, 2010).

"Opportunity-cost" theories of conflict (e.g. Grossman, 1991; Fearon, 2008) are also close to greed theories in terms of focusing on the economic motivations for joining the insurgency, but their main emphasis is on the costs, rather than the benefits of such action. According to this approach, an increase in the income of the population raises the opportunity cost of joining the insurgency. Thus, development programs that reduce unemployment and increase the income of potential insurgents should reduce violence.

The "grievances" approach (Barry Posen, 1993; Ted Robert Gurr 1994; Roger Petersen, 2002) focuses on the psychological and sociological factors as the proximate causes of insurgency. According to this approach insurgency is fueled by political grievances of the population caused by ethnic or social cleavages and do not necessarily directly correspond to economic incentives. Economic factors can still have an important effect on insurgency by fueling these grievances, but only indirectly. According to this approach development programs should not have any effect on security as long as they do not affect the underlying social or ethnic tensions behind the insurgency.

Finally, the "hearts and minds" approach (Berman et al, 2009) emphasizes the role of the attitudes of the general population toward the government in determining the level of violence. According to this approach, increased support for the government makes people less likely to join or back the insurgents and more likely to share information about the insurgents with the government. This, in turn, increases the cost of violence for the insurgents and decreases their activity. As long as development programs increase support for the government through the provision of public goods and services, the expected result is a decrease in violence.

The literature also distinguishes two main mechanisms through which the population's support for the government influences the levels of violence. First, increased support for the government makes people more likely to share information about the insurgents, which in turn makes counterinsurgency more effective and reduces violence. Second, increased support for the government makes people less likely to join the insurgents. This makes the insurgents' labor constraints tighter and reduces violence (Condra et al., 2010). The main difference between the two mechanisms is in the timing of the effect. The information-sharing effect works almost instantly, and is expected to be observed even in the short-run, whereas the recruitment effect takes more time to take effect, and is observed only in the long-run.

Empirical Evidence

There is a new line of research that provides empirical evidence to test the aforementioned theories of conflict in the context of insurgency. Looking at macroeconomic factors behind conflict, Berman, Felter, and Shapiro (2009) examine the correlation between unemployment rates and the rate of insurgent attacks in Iraq and the Philippines. Contrary to opportunity-cost theories, they find that there is a negative relationship between unemployment and attacks against the government and allied forces and no significant relationship between unemployment and the rate of insurgent attacks that kill civilians.

Condra et al (2010) analyze the effect of civilian casualties on insurgent violence. They find that both in Afghanistan and in Iraq civilian casualties lead to increased insurgent violence, which is consistent with a "revenge" effect, driven by the population's grievances. In Afghanistan the effect is observed only in the long run, but does not have any effect in the short-run, suggesting that the results are driven by the recruitment mechanism, i.e. that the level of violence is determined primarily by the number of willing combatants. In Iraq, however, the effect is observed only in the short-run, suggesting that the results are driven by the information mechanism, i.e. the level of insecurity is determined primarily by people's willingness to share information with the counterinsurgents.

The two recent studies on the effect of development programs on violence are Berman, Shapiro and Felter (2009) and Crost and Johnston (2010). While the results in Berman, Shapiro and Felter (2009) provide support for the "hearts and minds" paradigm, the results in Crost and Johnston (2010) are consistent with the bargaining model. The difference in the results of these two studies can be attributed to the differences in the nature of the conflicts and to the divergent characteristics of the

development programs. The war in Iraq started in 2003 and has involved foreign military forces as a main party to the conflict. The civil conflict in the Philippines, on the other hand, has been ongoing for over four decades and involves no foreign occupier. The mechanism of aid delivery is also different. The military assistance program (Commanders' Emergency Reconstruction Program - CERP) in Iraq is relatively small-scale and is largely carried out by men in uniform. The funds are in the discretion of military commanders who use them for the implementation of security-enhancing local projects. In contrast, KALAHI-CIDSS is the biggest development program in the Philippines, run by the government and funded through World Bank loans. In that regard the design of the community driven development program in Afghanistan (the National Solidarity Program-NSP), examined in this paper, is closer to the KALAHI-CIDSS program in Philippines than to CERP in Iraq.

III. Description of the Experiment

III.1. National Solidarity Programme

The National Solidarity Programme (NSP), which began operations in June 2003, is Afghanistan's largest development programme. NSP uses the community-driven model of aid delivery, and is structured around two major interventions at the village level. With a view to building representative institutions for village governance, NSP mandates the creation of a Community Development Council (CDC) in each village. CDCs are created through a secret-ballot, universal suffrage election and are composed of an equal number of men and women. The second principal intervention of NSP is to disburse block grants, valued at $200 per household up to a village maximum of $60,000, to support the implementation of projects designed and selected by the CDC in consultation with the village community. Projects are ordinarily focused on either infrastructure, such as drinking water facilities, irrigation canals and roads, or services, such as training and literacy courses. NSP is executed by the Ministry of Rural Rehabilitation and Development (MRRD) of the Government of Afghanistan, funded by the World Bank and a consortium of bilateral donors, and implemented by around 25 NGOs. By mid 2010 NSP had already been implemented in over 29,000 villages across 361 of Afghanistan's 398 districts at a cost of nearly $1 billion.

III.2. Sample

The field experiment described in this paper was conducted as part of an impact evaluation of NSP. Ten districts with no prior NSP activity that had a sufficiently large number of villages and satisfactory security conditions were selected for evaluation. Although none of the ten sample districts are drawn from Afghanistan's southern provinces due to security constraints, the districts otherwise provide a reasonably balanced sample of Afghanistan's major regions, including the western, central highlands, northern, northeastern, and eastern regions (see Figure 1). The ten districts also provide a representative sample of Afghanistan's ethno-linguistic diversity, with five predominantly Tajik districts, four predominantly Pashtun districts, and one predominantly Hazara district. The districts of Balkh and Gulran also contain significant numbers of Uzbek and Turkmen minorities, respectively. The seven NGOs contracted to work in the sample districts provide a mix of small and large, international and local NGOs.

In terms of security conditions, the ten evaluation districts are representative of the whole of Afghanistan excluding the south. Figure 2 shows the average number of security incidents per district for the period between January 2006 and February 2010 based on International Security Assistance Force (ISAF) data. The numbers are reported separately for the area within a 20km radius around the evaluation villages; for the southern provinces only; and for the whole of Afghanistan excluding the south. Throughout the whole period, the numbers are similar for the area around the evaluation villages and for the whole Afghanistan excluding the south. The number of security incidents in the southern provinces, however, is noticeably higher and on a sustained rise starting spring 2007.

Among the ten evaluation districts there are two districts from the eastern province of Nangarhar that have significantly higher levels of violence and that are closer to the levels observed in the southern provinces as compared with the other eight evaluation districts. Thus, the two eastern districts can provide information on the potential effects of NSP on the reduction of violence in already insecure regions, whereas the other eight districts are representative of the rest of the country including "marginal" districts that are at a potential tipping point and could turn insecure if the situation deteriorates. The evaluation sample thus, provides good information on the effect of NSP both on the reduction in existing violence and on preventing the further spread of violence.

From each of the ten sample districts, 50 villages were selected to be included in the study.[3] In each district, 25 villages were selected to be treatment villages using a matched-pair randomization procedure. These villages received NSP following the administration of a baseline survey in September 2007, with the remaining 250 control villages assigned to not receive NSP until after the conclusion of the second follow-up survey in 2011.

At the household level, the sample also appears to be broadly representative of the population of rural Afghanistan, though somewhat biased towards more rural and more remote communities. A comparison of key characteristics of household respondents for the first follow-up survey of the NSP impact evaluation and those of rural areas in the 2007–08 National Risk and Vulnerability Assessment (NRVA), administered to a random stratified sample of the population of Afghanistan, reveals only small differences between the two samples. The only difference is that households in the evaluation village are more likely to be engaged in production activities related to agriculture (see Table A1 in the Appendix). Though there is no significant difference in the age of respondents, they do appear to be more resource constrained and to have worse access to medical services, and slightly better access to electricity, although the magnitude of the differences is quite small.[4]

III.3. Assignment of Treatment

To improve statistical balance between villages in the control and the treatment groups, a matched-pair cluster randomization procedure was applied. The procedure proceeded in four stages.

1. *Village Clusters***.** To minimize potential for spillovers between treated and untreated units, villages located within 1 kilometer were grouped in village clusters. Of the 500 sample villages, 107 were assigned to 41 village clusters. The number of villages in each village cluster ranged from two to six.

2. *Matched Pairs***.** In each district, the 50 sample villages were paired into 25 groups of two using an optimal greedy matching algorithm, which matched villages to ensure similarity based on background characteristics provided that the villages were not in the same village cluster. The matching was based on the information available before the baseline survey and used

[3] In each district NGOs chose another 15 communities that received NSP and were not included in the experiment. These villages were usually the most easily accessible from the district center, which farther shifts the sample towards more remote villages.

[4] The differences are likely to be driven by the fact that the villages that are located closer to big cities and provincial centers received NSP between 2003 and 2007, i.e. before the start of the impact evaluation and, are thus, excluded from the analysis.

such background characteristics as the size of the village (based on the data collected a few years earlier by the Central Statistics Organization) and geographic variables (distance to river, distance to major road, altitude, average slope).

3. *Assignment of Treatment***.** In each matched pair one village was randomly assigned to receive NSP, such that the clusters of villages were assigned the same treatment status.[5] The assignment was performed after the baseline survey was conducted, but before the data was processed.

4. *Violations of Clustering Restrictions***.** In a few districts, the large number of clustered villages precluded the co-assignment of all the villages in the same village cluster to the same treatment status. For cases in which assignment of treatment status without a violation of the clustering restriction was not possible, the number of violations was minimized through a simulation approach.[6]

As expected, the randomization procedure was successful in ensuring statistical balance between treatment and control groups. **Error! Reference source not found.** below presents means, normalized differences,[7] and t-statistics for several important variables using data from the baseline survey. Comparison of means and normalized differences indicates that the treatment assignment mechanism produced very high levels of statistical balance between the treatment and control groups. Among the variables listed, the difference between the means of the two groups is always smaller than 13 percent of the standard deviation.

IV. Hypotheses

The main goal of the paper is to test the "hearts and minds" approach to counterinsurgency. According to this theory development programs positively affect people's economic welfare, which in turn improves their attitudes towards the government, and, as a consequence, reduces insurgent violence. We proceed to formulate three empirical hypotheses related to the three steps in the

[5] The experiment also introduced variation in the method of election of the Community Development Council and in the method of selection of the projects. All the treatment villages were randomly assigned one of the two election methods and one of the two selection methods. The results of this intervention are described in Beath, Christia and Enikolopov (2011a, 2011b). For the purposes of this study, however, we do not separate treatment villages into different groups.

[6] The clustering restriction was violated in 17 village clusters (covering 44 villages).

[7] Per Imbens and Wooldridge (2009), normalized differences are differences divided by pooled standard errors.

predictions of the model. We also formulate two additional hypotheses that are related to the mechanisms behind the observed effects.

> *Hypothesis 1.* People's level of economic wellbeing is better in villages that have received a development program.

This hypothesis tests whether the villagers receive actual material benefits from the development program. Although it is theoretically possible that development programs might improve attitudes toward the government even if they fail to provide direct benefits (e.g. by showing that the government is at least trying to improve people's life) a more plausible mechanism is that people's attitudes toward the government improve as a result of an improvement in their economic situation resulting from the development program.

Since, according to the "hearts and minds" approach the behavior of people is primarily determined by their attitudes, subjective perceptions of their economic situation might be as important as objective economic outcomes. Thus, to test this hypothesis we look both at objective measures of economic wellbeing (such as income, consumption, occupation status) and subjective perceptions of economic wellbeing by the respondents (i.e. whether the respondents report that their economic situation has already improved and whether they expect it to improve in the future).

The first hypothesis is consistent not only with the "hearts and minds" approach , but also with the "opportunity cost" theory, since an increase in income and in employment raises the costs of participation in the insurgency.

> *Hypothesis 2.* People will have more positive attitudes towards the government, NGOs and foreign troops in villages that have received a development program.

This hypothesis tests the next step in the logic of the "hearts and minds" approach. Namely, that the material benefits received by the population will improve their attitudes toward those who provide these benefits. Since NSP is managed by the central government of Afghanistan, but funded by international donors and implemented on the ground by NGOs, we should expect an improvement in villagers' attitudes towards all these parties.

The second hypothesis is important for distinguishing between different theories, since the "hearts and minds" approach is the only one that predicts an improvement in attitudes toward government.

Finally, according to the "hearts and minds" theory, improved attitudes towards the government and towards international forces should decrease popular support for the insurgents, which should in turn lead to a decrease in security incidents. Thus, we formulate the following hypothesis.

Hypothesis 3: The security situation is better in villages that have received a development program.

Hypothesis 3 is also consistent with the "opportunity cost" theory, but is inconsistent with the "greed" theory and the "bargaining" theory, both of which predict that the existence of a development program would lead to an increase in insecurity.

According to the "hearts and minds" theory, reliable delivery of public goods and an improvement in the overall economic situation are enough to bring the general population on the side of the government and prevent them from joining the insurgency. However, if the violence itself becomes the population's main problem, economic improvements might not suffice to win popular support for the government if they are not coupled with improvements in the underlying security situation. In that case development programs alone will not have an effect on the levels of violence. Thus, we formulate the following hypothesis:

Hypothesis 4: In regions with high levels of violence a development program will not affect people's attitudes towards the government neither will it affect the security situation.

To examine whether the reduction in violence is driven by the population's increased willingness to share information with counterinsurgents or by people's reduced willingness to join the insurgents, we examine separately the effect of the program on insecurity in the short-run and in the longer-run. According to Condra et al (2010) the level of violence in Afghanistan is determined primarily by the number of willing combatants. Thus, we would expect to see the effect of the program manifest itself only in the long-run.

Hypothesis 5: A decrease in security in villages that have received a development program is observed only in the long run.

V. Data

V.1. Data Sources

Data for this paper come from three sources: our baseline survey, our follow-up survey, and ISAF data on security incidents.

Baseline Survey. Data from the baseline survey was collected during August and September 2007 before randomization took place. The survey consisted of four different instruments: (a) a male

household questionnaire administered to ten randomly-selected male heads-of household in each village; (b) a male focus group questionnaire administered to a group of village leaders in each village; (c) a female focus group questionnaire administered to a group of important women who tended to overwhelmingly be wives or other relatives of the village leaders; (d) a female individual questionnaire. Because of logistical and cultural constraints instruments aimed at female participants could be administered in only 406 of the 500 evaluation villages.

Follow-up survey. Data from the follow-up survey was collected between May and October 2009. The follow-up survey was administered after the elections of the CDCs and the selection of the projects had taken place, and work on their implementation had started, but before all the projects were fully completed. The follow-up survey consisted of the same four instruments as the baseline survey, although the questions in the baseline and follow-up surveys were somewhat different. In addition, the female individual questionnaire was administered differently during the baseline and the follow-up surveys. During the baseline survey, it was administered to the same participants as the female focus group but was conducted on a one-to-one basis. During the follow-up survey, it was administered to the wife of the respondent of the male household questionnaire.[8] Detailed information on the coverage of the baseline and follow-up surveys can be found in Table A2 in the Appendix.

Not all 500 sample villages were able to be surveyed during the first follow-up survey due to deterioration in security conditions affecting 11 treatment and 15 control villages, located primarily in the districts of Sherzad and Daulina. Cultural sensitivities precluded the administration of female household and female focus group questionnaires in an additional 21 control and 22 treatment villages spread across Sherzad, Daulina, Adraskan, and Chisht-e Sharif. In both cases the attrition was not related to the treatment status of the villages and differences between treatment and control groups in village-level attrition are not statistically significant.

Enumerators administering the male household questionnaire for the first follow-up survey were instructed to locate and interview the same households and, whenever possible, the same villagers who participated in the baseline survey. During the first follow-up survey, enumerators were able to successfully administer the male household questionnaire to male respondents in 65 percent of

[8] During our baseline survey, an individual survey was administered only to female elites because of logistical constraints. During our follow-up survey potential panel data on individual responses of the female elites was sacrificed in order to measure attitudes of the ordinary female villagers.

households in which male respondents were interviewed during the baseline survey. The predominant reason for enumerators not being able to interview baseline respondents was that the person was away from home on the day that the survey team visited the village as it was the time of harvest. Differences between treatment and control groups in individual-level attrition are not statistically significant.

Security incidents. Data on security incidents comes from the ISAF Combined Information Data Network Exchange (CIDNE) database, which includes declassified fields such as date, time, location, and type of attack. The data contains information on all security incidents in ten evaluation districts for the period between March 2003 and March 2010. Overall, there were 535 security incidents before the start of mobilization of villages under NSP in these districts in October 2007 and 688 such incidents after the start of NSP activities. Almost all the incidents are related to Improvised Explosive Devices (IED), with 45% of incidents being IED explosions and 53% incidents in which an IED was found and cleared. The remaining two percent of incidents were related to mine strikes.

Using these data we constructed dummy variables that indicate whether there was at least one security incident starting from October 2007 within 1, 3 or 10 kilometers of a particular village. To measure the level of violence before the start of the program and to separate between short-run and long-run effects of the program on security we construct these indicators separately for three periods of time: between March 2003 and September 2007 (to measure the existing level of violence), between October 2007 and December 2008 (which is considered the short run) and for the period between January 2009 and March 2010 (which is considered the longer run).

There is a notable difference in the levels of violence in the two districts that come from the eastern province of Nangarhar (Sherzad and Hisarak) and the remaining eight districts under evaluation. The share of villages in these two districts for which at least one security incident occurred within 1, 3 or 10 kilometers before the start of the program was 8, 20, and 50 percent receptively, while for the remaining districts the respective shares were only 0, 4 and 13 percent.

VI. Results

All hypotheses are tested by regressing the measures relevant for each hypothesis on a treatment indicator variable using the following OLS model:

$$Y_{vi} = \alpha + \tau * T_v + \gamma * T_v * East_v + \varphi_p + \varepsilon_{vi} \quad (1)$$

where Y_{vi} is the outcome of interest for household *i* in village *v*, T_v is the village treatment dummy (i.e. whether this is an NSP village or not), $East_v$ is the dummy for villages from the two eastern districts, φ_p is the village-pair fixed effect, and ε_{vi} is the error term.

Following the recommendation in Bruhn and McKenzie (2009) we include village-pair fixed effects to account for the fact that villages were allocated to treatment using pair-wise matching. Standard errors are clustered at the village cluster level, to take into account the fact that the residual may be correlated within clusters of villages due to the fact that the assignment of treatment within clusters is not independent. Some indicators are constructed on the village level, rather that the individual level, so that the outcome is captured as Y_v rather than Y_{vi}.

To test Hypothesis 1, we look at the effects of the program on the economic situation of the villagers. For objective measures of the household's economic situation we look at the household's annual income and consumption, whether the head of household is unemployed or involved in subsistence agriculture or husbandry, which in the context of Afghanistan is practically equivalent to being unemployed. The results indicate that the average treatment effect on income, consumption and the share of unemployed is not statistically significant, whereas the share of villagers involved in subsistence agriculture and husbandry is lower in treatment villages by 3 percent (see Panel A in **Table 2**). The effect in the two eastern districts is significantly higher for income, which in the eastern districts increases by 9 percent, and for the share of unemployed, which decreases by 2 percentage points. The effect of the program in the two eastern districts on consumption and on the share of villagers involved in subsistence agriculture and husbandry is not statistically different for the average treatment effect.

Results in Panel B in **Table 2** indicate, that there is a strong effect of the program on the perception of the villagers' economic situation. Specifically, both male and female respondents in NSP villages are more likely to report that the economic situation in their household has improved as compared to a year ago. They are also more likely to indicate that they expect the economic situation in the village to improve in the next year. For all the measures there is approximately 5 percentage points more respondents in NSP villages that have a positive view on the past as well as the future trends in their economic situation, which corresponds to 11% and 18% depending on the measure. In the two eastern districts the positive effect of the program is three times higher for the share of female

respondents reporting that the economic situation has improved in the last year, and similar for all other measures.

As an additional measure that reflects peoples' perception of their current and expected future economic wellbeing in the village we use information on net migration to the villages. The results in Panel C of **Table 2** indicate that the average effect on the migration to treatment villages is not statistically significant, but the effect in the two eastern districts is rather strong – the average net migration to treatment villages in the two districts was higher by almost 30 families per year as compared to control villages.

Overall, the program has a clear positive effect on the economic situation of the villagers and is especially strong in the two eastern districts. Thus, the results provide strong support for Hypothesis 1.

We test Hypothesis 2 by examining the effects of the program on villagers' attitudes toward different government bodies, NGOs and ISAF forces. In the analysis we use multiple measures of attitudes toward government agents, NGOs and ISAF forces. To be able to draw general conclusions and to improve statistical power, in addition to individual measures, we also use a summary index similar to the one used in Kling, Leibman and Katz (2007). The summary index is defined to be the equally weighted average of z-scores of the nine individual attitudinal measures. The z-scores are calculated by subtracting the control group mean and dividing by the control group standard deviation. Thus, each component of the index has a mean equal to 0 and a standard deviation equal to 1 for the control group.

The results reported in **Table 3** indicate that respondents in NSP villages have more positive attitudes toward almost all government agents, including district and provincial governors, central government officials, the president of Afghanistan, members of parliament and government judges. The program leads to an increase in the number of respondents who have a positive view of government agents, which varies between almost 8 percentage points for the members of parliament to 4 percentage points for the national police (corresponding to 14% and 5% increase respectively). There is also a positive effect of NSP on the attitudes of the villagers toward NGOs and ISAF soldiers. The results for this summary measure indicate that the introduction of NSP improved villagers' attitudes by 13% of a standard deviation.

The results for the two eastern districts, however, are completely different. There is no positive effect of the program on the attitudes toward any government bodies. The effect on the attitudes toward the president and the national police turns out to be significantly negative. There is also no positive effect on attitudes toward NGOs and ISAF military forces.

Overall, the results indicate that on average the program improves people's attitudes toward all levels of government (expect for the national police), NGOs and ISAF military forces. This provides strong support for Hypothesis 2. However, there is no positive effect on attitudes in the districts with high levels of initial violence, which provides support for Hypothesis 4.

To test Hypothesis 3 we use two different sources of information. First, we examine security perceptions as reported by male and female respondents in the surveys. Next, we look at the number of reported security incidents based both on the information from the survey of villagers and on ISAF data.

Results for people's security perceptions are reported in **Table 4** and indicate a strong difference between treatment and control villages. The number of male respondents in NSP villages who report an improvement in the security situation in the past two years is 6 percentage points higher, whereas the number of respondents who think that the security situation has deteriorated is 3 percentage points lower (corresponding to an 8% and 16% difference respectively).[9] Among females the number of respondents who think that women and girls feel safer compared to two years ago is higher in NSP villages by 5 and 4 percentage points respectively, which corresponds to a 17% and 15% difference. At the same time, the number of respondents who think that women and girls feel less safe is lower in NSP villages noting a decrease of 4 percentage points, which corresponds to a 23% decrease for the question about women and a 17% decrease for the question about girls. The results for the summary measure indicate that the introduction of NSP improved villagers' perception of the security situation by 10% of a standard deviation.

The difference between the average treatment effect of the program on the perception of security and the effect in the two eastern districts is not statistically significant. However, the effect is smaller

[9] Note that the three pairs of questions on improvement/deterioration of the security situation are not independent, since each pair is based on one question on the changes in the situation with three possible answers – the situation has improved, the situation have not changed, and the situation has deteriorated. We construct two dummy variables for improvement/deterioration of the security situation based on these questions to provide a meaningful comparison of the averages between the treatment and control villages. Since the measures are not independent we do not combine them using summary indices.

for all the measures and for some of them it even changes sign. Additional analysis reveals that the effect of the program on the perceptions of security in the two regions is not statistically significant for any of the measures.

The results on the effect of the program on the number of reported security incidents are presented in **Table 5**. The program has no significant effect on the number of security incidents in or around villages as reported by villagers (Panel A of **Table 5**). In both treatment and control villages approximately 3% of respondents indicate that their village experienced an attack in the past year and that they themselves were affected by insecurity in the village or on roads around the district. The results indicate that there is no difference in the security index that reflects security incidents based on the answers of male respondents. In the two eastern districts the results are similar.

Finally, we use ISAF data to see if there is a difference in the number of security incidents that took place in the vicinity of treatment and control villages after the start of the program. To test Hypothesis 4 we look separately at the number of incidents in the short run (in the first 15 months after the start of the program) and in the long run (in the next 15 months). The results indicate that in the short-run the probability of having an incident within 3 or 10-kilometer radius of each village is not statistically different between treatment and control villages (there were no security incidents in the short-run within 1 kilometer radius of the evaluation villages in non-eastern districts, so we cannot estimate this effect). In the long run, however, the probability of having an incident both in a 1 and in a 10-kilometer radius is smaller in treatment villages by 2 and 4 percentage points. For the 3-kilometer radius the probability is also lower by 2 percentage points, but the effect is not statistically significant.

In the eastern districts the short-run effect of the program is similar to the average effect. The long-run effect in the eastern district is however significantly different for the 3-kilometer radius. For this measure the effect even changes its sign. For the 1-kilometer radius the effect is the same in size and for the 10-kilometer radius it is smaller by half, although the difference is not statistically significant. Additional tests reveal that the effect of the program in the eastern districts is not statistically significant for any of the measures based on the ISAF data on security incidents.

Overall, there is strong evidence that the perception of security situation is better in villages mobilized by NSP. There is no noticeable effect of NSP on the security situation as measured by the number of security incidents reported by survey respondents, but the number of security incidents

recorded by ISAF is lower around treatment villages. Thus, the results provide support for Hypothesis 3. The positive effect of the program is not observed in the two eastern districts, which are characterized by high levels of initial violence. Thus, the results support Hypothesis 4. Consistent with Hypothesis 5 the positive effect of the program on security is observed only in the long run.

Robustness of the results

To check for the robustness of the results we have included as additional controls the variables that indicated the answer to the same (or the most closely related) question in the baseline survey. The results prove to be robust to the addition of such control, although a small number of results lose their significance when we control for individual level controls (see Table A3 in the Appendix). However, additional checks reveal that the loss of significance is driven by the reduction in the sample size caused by individual-level attrition.

An important characteristic of the two eastern districts is that they are predominantly ethnic Pashtun. To check whether the difference in the results for the eastern districts is driven by ethnic composition, rather than the level of violence, we also examine whether the effect is different in the other two predominantly Pashtun districts in our sample other than Sherzad and Hisarak (those being Farsi and Balkh).

The results indicate that there is only a small difference in the effect of the program in Pashtun regions as compared with other districts (see Table A4 in the Appendix). There is no difference in the effect on economic outcomes except for the absence of the effect on household income. For the effect on attitudes towards the government the only significant difference is that the positive effect on the attitudes toward the president is somewhat smaller. For the effect on the perception of security the only significant difference is that the effect on the number of female respondents who feel that security for women has deteriorated is not present in eastern regions. For the measures of reported security incidents there are conflicting results, since the only two significant results (on the number of attacks by anti-government forces reported by villagers and on the number of security incidents recorded by ISAF within 1 kilometer radius in the long run) go in opposite direction. Overall, the effect of the program in non-eastern Pashtun regions is similar to the effect in other regions of Afghanistan.

VII. Discussion of Results

The results provide strong support for all the steps in the "hearts and minds" paradigm. First, the program has a positive effect on the economic wellbeing of the population. Second it improves attitudes towards the government and other parties associated with the program (NGOs and foreign military). And finally, it has a positive effect on the security situation. Both men and women in the treatment villages are more likely to report that the security situation in and around villages has improved and that they feel safer. There is also evidence that the program reduces the number of incidents around villages in the long run, but not in the short run.

The results on the positive effect of the program on economic and security outcomes are consistent not only with the "hearts and minds", but also with an "opportunity cost" interpretation, although that would not predict changes in attitudes toward the government. The results are not consistent with a "grievance" explanation, which would predict no effect on attitudes and security, since the program is not affecting fundamental social or ethnic conflicts in Afghan society. The results are also not consistent with the "greed" or "bargaining" models, both of which predict an increase in violence. Thus, even if the effects on violence described in the "greed" and "bargaining" models are operating, they are dominated by the opposite effects described in the "hearts and minds" and "opportunity cost" approaches.

Moreover, the fact that we observe reduction in violence only in the long run suggests, that in Afghanistan the level of violence is affected primarily by people's willingness to join the insurgency, rather than by their willingness to share information, which is consistent with findings in Condra et al (2010). Unfortunately, we do not have data on whether the villagers actually provide information to counterinsurgency efforts nor do we have the data on who is joining the insurgency. Thus, we do not have direct evidence on the mechanisms that link increased government support with a reduction in violence although indirect evidence suggests that the willingness to join the insurgency plays a more important role in Afghanistan.

In generalizing the results to other settings it is important to bear in mind that NSP, although funded by international donors, is managed by the Afghan government. Thus, these results cannot be easily extended to programs in which development projects are delivered by a foreign military power (e.g. CERP in Iraq or Afghanistan), as in that case it is not entirely clear how these programs

are perceived by the local population and whether such programs would improve the attitudes toward the government of the country where the program is implemented.

An important methodological issue on the effect of the program on security has to do with externalities between villages that can bias the results downward. An increase in government support in a particular village is likely to reduce violence not only near the village itself, but also in neighboring villages. This is especially true if the program reduces the number of people willing to join the insurgency, since the insurgents do not necessarily operate close to the place where they have been recruited. Such positive spillovers from treatment to control villages will reduce the estimated effect of the program. The clustering of neighboring villages, which was aimed at reducing such inter-village spillovers, might not be enough to address this issue as long as these positive externalities on security are sufficiently strong. In this case, a single village might not be the proper unit of analysis, and we should be comparing bigger geographical units, such as districts. Unfortunately, we cannot perform such an analysis in the context of this field experiment, since the choice of the district could not be randomized.

Our results indicate that the positive effect of the program on attitudes towards the government is not observed in the two eastern districts with the highest level of security problems. This suggests that development programs might be more effective in preventing the spread of violence in relatively secure regions, but are considerably less effective in reducing the violence in regions in which the violence is already high. In relatively secure regions the population is primarily concerned with harsh economic conditions, so that government attempts to improve their material wellbeing are likely to have a strong effect on people's attitudes toward the government in turn reducing their willingness to join the insurgency. In regions with high levels of violence, security is likely to be the main concern on people's mind, so that improvements in economic outcomes are not enough to change people's attitudes toward the government as long as insecurity is raging strong. Thus, these results suggest that development programs are more effective in preventing the spread of violence, rather than in reducing the level of violence. These results are consistent with findings in Bearman et al (2009) that development programs in Iraq improved security only after a significant increase in the number of troops in 2007.

VIII. Conclusion

In this paper we analyze the effect of the National Solidarity Program— the largest development program in Afghanistan—on counterinsurgency outcomes. Specifically, we look at people's levels of livelihood as well as their attitudes towards their economic wellbeing and their government and also examine the program's effect on levels of security. Random assignment of the program across 500 evaluation villages allows us to estimate the program's causal effects. Our results indicate that the program has a significant positive effect on the economic wellbeing of the villagers and their attitude toward the government (both on the local and central level), as well as NGOs. There is also evidence of a weak positive effect on their attitudes toward ISAF soldiers. We also identify a positive effect of development aid on the security situation in the long run, but not in the short run. Notably, the effect of the program on attitudes toward the government and security is observed only in regions with moderate levels of violence. In regions with higher levels of violence there is no such effect, despite a stronger positive effect on economic outcomes.

Overall, the empirical evidence supports the different line of mechanisms underlying the strategy of winning "hearts and minds" through the provision of development projects. This development program improves the attitudes of the civilian population toward the government and makes them more likely to think that the government is working in their best interest, which in turn makes them less likely to support the insurgents. The fact that we observe the effect on security only in the long run suggests that support for the government reduces the violence mainly by reducing the number of people willing to join the insurgents, rather than by increasing the population's willingness to share information with the government. The results also suggest that development programs can prevent the spread of violence in relatively secure regions, but they are not effective in reducing the violence in regions that are already experiencing significant security problems.

The results overall suggest that the benefits of development programs are not limited to the provision of direct economic and social benefits. They can also contribute to long-term sustained development by preventing the spread of violent internal conflicts, which are at the core of problems in many developing countries.

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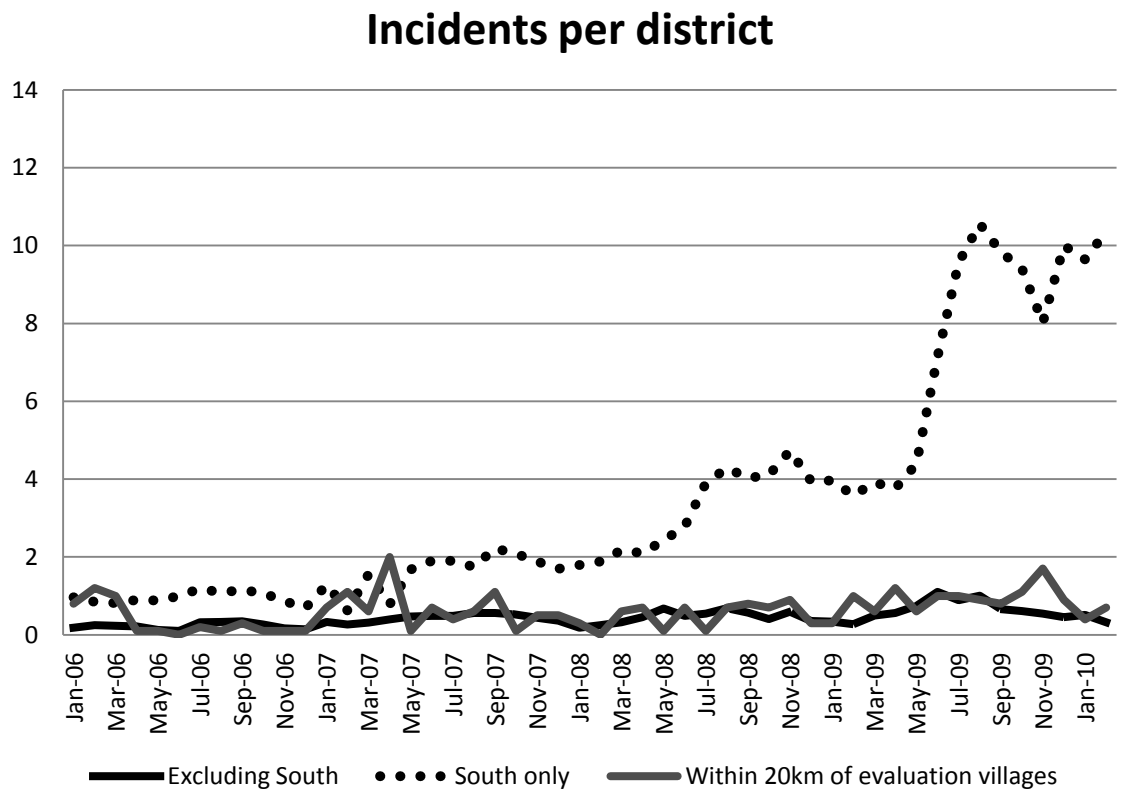
Figure 1. Ten Sample Districts

Figure 2. Average Number of Incidents per District



Note: The southern region includes the provinces of Helmand, Kandahar, Urozgan, Zabol, Nimruz, and Day Kundi.

Table 1: Statistical Balance between Treatment and Control Groups

Variable	Mean Level in Control Group	Mean Level in Treatment Group	Normalized Difference	*t*-Statistics
Number of Households in Village	103.02	109.76	0.07	0.76
Number of People in Household	9.87	9.76	- 0.02	- 0.42
Age of Respondent	43.30	43.80	0.04	1.10
Respondent Speaks Dari as Mother Tongue	0.69	0.70	0.04	0.45
Respondent Received no Formal Education	0.71	0.71	0.01	0.18
Household Has Access to Electricity	0.13	0.15	0.04	0.59
Male Health Worker is Available to Treat Villagers	0.10	0.13	0.12	1.32
Female Health Worker is Available to Treat Villagers	0.08	0.10	0.10	1.07
Main Source of Drinking Water is Unprotected Spring	0.27	0.27	- 0.00	- 0.02
Dispute among Villagers Occurred in Past Year	0.37	0.36	- 0.03	- 0.36
No Problems are Experienced in Meeting Household Food Needs	0.45	0.45	0.02	0.38
Household Borrowed Money in Past Year	0.48	0.47	- 0.02	-0.36
Respondent Reports Attending Meeting of Village Council in Past Year	0.30	0.31	0.03	0.59
Expenditures on Weddings in Past Year (*Afghani*s)	11,676	10,380	- 0.03	- 0.73
Expenditures on Food in Past Month (*Afghani*s)	3,644	3,566	- 0.04	- 0.68
Respondent Believes that Women Should be Members of Council	0.41	0.43	0.05	0.92
Views of Women are not Considered in Resolving Disputes	0.51	0.48	- 0.06	- 1.64
Assets	0.00	-0.01	- 0.02	- 0.52
Natural Log of Income	8.67	8.63	- 0.07	- 1.15
Security incident within 1 km of the village between 2004 and start of NSP	0.02	0.02	0.00	0.00
Security incident within 5 km of the village between 2004 and start of NSP	0.14	0.12	-0.06	-0.66
Security incident within 10 km of the village between 2004 and start of NSP	0.20	0.21	0.03	0.33

Table 2: Economic Outcomes

Variable	Mean in Control	Treatment Effect	Standard error	Eastern District* Treatment Effect	Standard error	N	R-squared
A. Income, Consumption, and Employment							
Ln(Annual Household Income)	7.077	0.027	[0.020]	0.061**	[0.029]	4,578	0.15
Ln(Annual Household Consumption)	7.509	0.004	[0.019]	0.030	[0.034]	4,315	0.22
Respondent is Unemployed	0.065	0.005	[0.007]	-0.024**	[0.011]	4,621	0.08
Respondent is Employed in Subsistence Agriculture and Husbandry	0.554	-0.032**	[0.014]	0.025	[0.038]	4,621	0.16
Summary Index	0	0.026**	[0.013]	0.011	[0.025]	4,665	0.18
B. Perceptions of Economic Situation by Male Respondents							
Respondent Perceives Household's Situation Has Improved in the Past Year	0.406	0.044***	[0.014]	0.016	[0.032]	4,662	0.21
Respondent Expects Economic Welfare of Villagers to Improve Next Year	0.302	0.053***	[0.013]	-0.006	[0.029]	4,633	0.11
C. Perceptions of Economic Situation by Female Respondents							
Respondent Perceives Household's Situation Has Improved in the Past Year	0.287	0.044***	[0.016]	0.079***	[0.027]	4,227	0.23
Respondent Expects Economic Welfare of Villagers to Improve Next Year	0.377	0.042***	[0.016]	0.024	[0.036]	4,213	0.18
D. Migration according to village leaders							
Net Number of Families Migrating to the Village	4.377	1.346	[1.634]	28.381*	[14.753]	460	0.66

Treatment effect is estimated in the regression, which includes a constant, a dummy variable for villages that have been assigned to the treatment group and fixed effects for the matched pairs. Robust standard errors adjusted for clustering at the village-cluster level in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3: Perceptions of Government, Civil Society, and ISAF Soldiers

Variable	Mean in Control	Treatment Effect	Standard error	Eastern District* Treatment Effect	Standard error	N	R-squared
District Governor Acts For the Benefit of All Villagers	0.654	0.061***	[0.014]	-0.018	[0.046]	4,414	0.28
Provincial Governor Acts For the Benefit of All Villagers	0.707	0.077***	[0.014]	-0.115***	[0.038]	4,148	0.26
Central Government Officials Act For the Benefit of All Villagers	0.688	0.061***	[0.015]	-0.080**	[0.036]	4,256	0.22
President of Afghanistan Act For the Benefit of All Villagers	0.801	0.057***	[0.012]	-0.097***	[0.023]	4,490	0.22
Members of Parliament Act For the Benefit of All Villagers	0.557	0.079***	[0.014]	-0.099***	[0.036]	4,409	0.24
Government Judges Act For the Benefit of All Villagers	0.512	0.063***	[0.017]	-0.067*	[0.040]	4,491	0.20
National Police Act For the Benefit of All Villagers	0.725	0.038***	[0.014]	-0.129***	[0.035]	4,556	0.22
NGO Employees Act For the Benefit of All Villagers	0.684	0.063***	[0.014]	-0.096***	[0.037]	4,472	0.17
ISAF Soldiers Act For the Benefit of All Villagers	0.289	0.042**	[0.016]	-0.030	[0.023]	4,062	0.18
Summary Measure	0	0.128***	[0.022]	-0.177***	[0.049]	4,660	0.28

Treatment effect is estimated in the regression, which includes a constant, a dummy variable for villages that have been assigned to the treatment group and fixed effects for the matched pairs. All the measures are based on the responses of male villagers. Robust standard errors adjusted for clustering at the village-cluster level in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4: Perceptions of Security

Variable	Mean in Control	Treatment Effect	Standard error	Eastern District* Treatment Effect	Standard error	N	R-squared
A. Security Perception by Male Respondents							
Respondent Believes Security In and Around Village Has Improved in Past Two Years	0.655	0.058***	[0.015]	-0.042	[0.032]	4,661	0.28
Respondent Believes Security In and Around Village Has Deteriorated in Past Two Years	0.121	-0.026**	[0.010]	0.041*	[0.021]	4,661	0.22
Summary Measure	0	0.099***	[0.027]	-0.106**	[0.051]	4,661	0.29
B. Security Perception by Female Respondents							
Respondent Believes that compared to two years ago women feel more safe in working for NGOs or the government or attending training courses	0.292	0.049***	[0.018]	-0.054	[0.038]	4,063	0.29
Respondent Believes that compared to two years ago women feel less safe in working for NGOs or the government or attending training courses	0.171	-0.039**	[0.016]	0.013	[0.032]	4,063	0.32
Respondent Believes that compared to two years ago teenage girls feel more safe when traveling to and from school or when socializing with other girls	0.294	0.044**	[0.018]	-0.069	[0.043]	4,020	0.27
Respondent Believes that compared to two years ago teenage girls feel less safe when traveling to and from school or when socializing with other girls	0.213	-0.037**	[0.017]	0.009	[0.055]	4,020	0.31
Summary Measure	0	0.098***	[0.034]	-0.084	[0.059]	4,102	0.29

Treatment effect is estimated in the regression, which includes a constant, a dummy variable for villages that have been assigned to the treatment group and fixed effects for the matched pairs. Robust standard errors adjusted for clustering at the village-cluster level in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5: Security Incidents

Variable	Mean in Control	Treatment Effect	Standard error	Eastern District* Treatment Effect	Standard error	N	R-squared
A. Security Experience According to Male Respondents							
Village Has Experienced Attack in Past 12 Months	0.035	-0.003	[0.009]	-0.007	[0.016]	4,661	0.33
Village Has Experienced Attack by Anti-Government Elements in the Past Year	0.029	-0.003	[0.008]	-0.008	[0.015]	4,664	0.34
Respondent Household Has Been Affected by Insecurity in Village During the Past Year	0.019	0.003	[0.006]	-0.003	[0.006]	4,660	0.27
Respondent Household Has Been Affected by Insecurity on Roads Around District During the Past Year	0.026	0.003	[0.005]	-0.003	[0.005]	4,660	0.12
Summary Measure	0	-0.003	[0.033]	0.032	[0.045]	4,666	0.34
B. ISAF data on security incidents							
Security incident within 1 km, short run[10]	0.006	.	[.]	-0.020	[0.027]	500	0.50
Security incident within 1 km, long run	0.026	-0.020**	[0.010]	0.000	[0.067]	500	0.57
Security incident within 5 km, short run	0.048	-0.010	[0.014]	0.010	[0.074]	500	0.61
Security incident within 5 km, long run	0.120	-0.020	[0.015]	0.180*	[0.105]	500	0.75
Security incident within 10 km, short run	0.236	-0.020	[0.022]	-0.060	[0.083]	500	0.81
Security incident within 10 km, long run	0.304	-0.045*	[0.025]	0.025	[0.068]	500	0.85

Treatment effect is estimated in the regression, which includes a constant, a dummy variable for villages that have been assigned to the treatment group and fixed effects for the matched pairs. Short-run effects are estimated using data between the start of the program in October 2007 and January 2009. Long-run effects are estimated using data between January 2009 and March 2010. Robust standard errors adjusted for clustering at the village-cluster level in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

[10] All security incidents within 1 kilometer around evaluation villages in the sort-run occurred near villages from eastern districts, so that the coefficients for Treatment cannot be identified.

Appendix

Table A1. Comparison of NSP Evaluation Sample with Representative Sample of Afghanistan's Rural Population

Indicator	NRVA (Rural Households)			NSP Follow-up Survey			t-statistics
	Mean	S.E.	Obs.	Mean	S.E.	Obs.	
Age of Male Respondent	43.04	0.12	16,143	42.68	0.23	4,660	1.381
Income from Primary Source (*Afghanis*)	60,950	468	16,065	58,618	1155	4,554	1.872
Household Engaged in Agriculture	0.661	0.004	16,143	0.723	0.007	4,625	-7.950
Access to Electricity	0.280	0.004	16,121	0.304	0.007	4,656	-3.065
Last Child Born is Alive	0.994	0.001	9,861	0.975	0.004	1,736	4.938
Last Birth Delivered at Home	0.871	0.004	9,817	0.892	0.007	1,744	-2.541
Last Birth Delivered in Hospital	0.065	0.003	9,817	0.036	0.004	1,744	5.625

Table A2: Composition and Coverage of NSP Impact Evaluation Surveys

	Baseline Survey (September 2007)	Follow –up Survey (May -October 2009)
Male Head-of-Household Questionnaire	4,895 in 500 villages	4,666 in 474 villages
Male Focus Group Questionnaire	5,334 participants in 500 villages	3,197 in 469 villages
Female Focus Group Questionnaire	3,670 participants in 406 villages	2,792 in 424 villages
Female Household Questionnaire	Not Conducted	4,234 in 431 villages
Female Individual Questionnaire	3,398 in 406 villages	Not Conducted

Table A3. Treatment Effect, Controlling for Baseline Values

Variable	Baseline Control	Level of aggregation for baseline measures	Treatment Effect	Std. Error	East* Treatment	Std. Error	N
A. Income, Consumption, and Employment							
Ln(Annual Household Income)	Ln(Annual Household Income)	Village	0.027	[0.020]	0.071**	[0.032]	4,578
		Individual	0.009	[0.029]	0.024	[0.043]	2,565
Ln(Annual Household Consumption)	Ln(Annual Household Consumption)	Village	0.008	[0.019]	0.042	[0.034]	4,315
		Individual	-0.037	[0.028]	0.111**	[0.043]	2,462
Male Respondent is Unemployed	Male Respondent is Unemployed	Village	0.006	[0.007]	-0.024**	[0.011]	4,621
		Individual	0.015	[0.011]	-0.025*	[0.014]	2,636
Male Respondent is Employed in Subsistence Agriculture and Husbandry	Male Respondent is Employed in Subsistence Agriculture and Husbandry	Village	-0.032**	[0.014]	0.032	[0.038]	4,621
		Individual	-0.036*	[0.019]	0.049	[0.045]	2,636
B. Perceptions of Economic Situation by Male Respondents							
Respondent Perceives Household's Situation Has Improved in the Past Year	Respondent Perceives Household's Situation Has Improved in the Past Year	Village	0.044***	[0.013]	0.013	[0.031]	4,662
		Individual	0.045**	[0.018]	0.017	[0.037]	2,644
Respondent Expects Economic Welfare of Villagers to Improve Next Year	Respondent Perceives Household's Situation Has Improved in the Past Year	Village	0.054***	[0.013]	-0.011	[0.028]	4,633
		Individual	0.032*	[0.018]	0.005	[0.037]	2,627
C. Perceptions of Economic Situation by Female Respondents							
Respondent Perceives Household's Situation Has Improved in the Past Year	Respondent Perceives Household's Situation Has Improved in the Past Year (Male Respondents)	Village	0.044***	[0.016]	0.072***	[0.028]	4,227
		Individual	0.069***	[0.021]	0.068*	[0.035]	2,362
Respondent Expects Economic Welfare of Villagers to Improve Next Year	Respondent Perceives Household's Situation Has Improved in the Past Year (Male Respondents)	Village	0.042***	[0.016]	0.028	[0.037]	4,213
		Individual	0.054**	[0.022]	-0.026	[0.049]	2,355
D. Migration according to village leaders							
Net Number of Families Migrating to the Village	Net Number of Families Migrating to the Village	Village	2.014	[1.765]	26.298**	[12.651]	460
E. Perceptions of Government, Civil Society, and ISAF Soldiers by Male Respondents							
District Governor Acts For the Benefit of All Villagers	District Governor Acts For the Benefit of All Villagers	Village	0.061***	[0.013]	-0.013	[0.046]	4,414
		Individual	0.046**	[0.018]	0.015	[0.050]	2,507
Provincial Governor Acts For the Benefit of All Villagers	Provincial Governor Acts For the Benefit of All Villagers	Village	0.076***	[0.014]	-0.113***	[0.038]	4,148
		Individual	0.080***	[0.019]	-0.107***	[0.041]	2,297
Central Government Officials Act For the Benefit of All Villagers	Central Government Officials Act For the Benefit of All Villagers	Village	0.061***	[0.015]	-0.079**	[0.036]	4,256
		Individual	0.071***	[0.020]	-0.069	[0.044]	2,346
President of Afghanistan Act For the Benefit of All Villagers	President of Afghanistan Act For the Benefit of All Villagers	Village	0.057***	[0.012]	-0.098***	[0.023]	4,490
		Individual	0.069***	[0.018]	-0.100***	[0.026]	2,460
Members of Parliament Act For the Benefit of All Villagers	Members of Parliament Act For the Benefit of All Villagers	Village	0.079***	[0.014]	-0.100***	[0.037]	4,409
		Individual	0.087***	[0.020]	-0.098**	[0.046]	2,432
NGO Employees Act For the Benefit of All Villagers	NGO Employees Act For the Benefit of All Villagers	Village	0.064***	[0.014]	-0.104***	[0.036]	4,472
		Individual	0.073***	[0.019]	-0.073*	[0.040]	2,429
F. Security Perception by Male Respondents							
Respondent Believes Security In and	Household has been affected by war and	Village	0.058***	[0.015]	-0.045	[0.032]	4,661

Variable	Baseline Control	Level of aggregation for baseline measures	Treatment Effect	Std. Error	East* Treatment	Std. Error	N
Around Village Has Improved in Past Two Years	insecurity in Past 12 Months	Individual	0.051**	[0.021]	-0.046	[0.042]	2,646
Respondent Believes Security In and Around Village Has Deteriorated in Past Two Years	Household has been affected by war and insecurity in Past 12 Months	Village	-0.026***	[0.010]	0.041*	[0.022]	4,661
		Individual	-0.034***	[0.013]	0.042*	[0.023]	2,646
G. Security Perception by Female Respondents							
Respondent Believes that compared to two years ago women feel more safe in working for NGOs or the government or attending training courses	Household has been affected by war and insecurity in Past 12 Months (Male respondents)	Village	0.049***	[0.018]	-0.054	[0.037]	4,063
		Individual	0.086***	[0.024]	-0.091*	[0.047]	2,263
Respondent Believes that compared to two years ago women feel less safe in working for NGOs or the government or attending training courses	Household has been affected by war and insecurity in Past 12 Months (Male respondents)	Village	-0.042***	[0.016]	0.011	[0.032]	4,063
		Individual	-0.038**	[0.018]	-0.005	[0.035]	2,263
Respondent Believes that compared to two years ago teenage girls feel more safe when traveling to and from school or when socializing with other girls	Household has been affected by war and insecurity in Past 12 Months (Male respondents)	Village	0.046**	[0.018]	-0.067*	[0.040]	4,020
		Individual	0.077***	[0.023]	-0.136***	[0.045]	2,247
Respondent Believes that compared to two years ago teenage girls feel less safe when traveling to and from school or when socializing with other girls	Household has been affected by war and insecurity in Past 12 Months (Male respondents)	Village	-0.041**	[0.017]	0.006	[0.053]	4,020
		Individual	-0.020	[0.020]	-0.027	[0.069]	2,247
H. Security Experience According to Male Respondents							
Village Has Experienced Attack in Past 12 Months	Household has been affected by war and insecurity in Past 12 Months	Village	-0.003	[0.009]	-0.008	[0.016]	4,661
		Individual	-0.010	[0.013]	0.009	[0.016]	2,644
Village Has Experienced Attack by Anti-Government Elements in the Past Year	Household has been affected by war and insecurity in Past 12 Months	Village	-0.003	[0.009]	-0.008	[0.016]	4,661
		Individual	-0.008	[0.012]	0.008	[0.014]	2,647
Respondent Household Has Been Affected by Insecurity in Village During the Past Year	Household has been affected by war and insecurity in Past 12 Months	Village	0.003	[0.006]	-0.003	[0.006]	4,660
		Individual	0.001	[0.007]	-0.005	[0.008]	2,645
Respondent Household Has Been Affected by Insecurity on Roads Around District During the Past Year	Household has been affected by war and insecurity in Past 12 Months	Village	0.003	[0.005]	-0.004	[0.005]	4,660
		Individual	0.008	[0.007]	-0.012	[0.007]	2,645

Variable	Baseline Control	Level of aggregation for baseline measures	Treatment Effect	Std. Error	East* Treatment	Std. Error	N
I. ISAF data on security incidents							
Security incident within 1 km, short run[11]	Security incident within 1 km	Village	.	[.]	-0.020	[0.030]	500
Security incident within 1 km, long run	Security incident within 1 km	Village	-0.020**	[0.010]	0.000	[0.067]	500
Security incident within 3 km, short run	Security incident within 3 km	Village	-0.008	[0.014]	0.002	[0.071]	500
Security incident within 3 km, long run	Security incident within 3 km	Village	-0.017	[0.015]	0.164	[0.105]	500
Security incident within 10 km, short run	Security incident within 10 km	Village	-0.016	[0.023]	-0.064	[0.083]	500
Security incident within 10 km, long run	Security incident within 10 km	Village	-0.050**	[0.024]	0.030	[0.068]	500

[11] All security incidents within 1 kilometer around evaluation villages in the sort-run occurred near villages from eastern districts, so that the coefficients for Treatment and Treatment*East cannot be identified.

Table A4. Treatment Effect in Pashtun Regions

Variable	Treatment Effect	Std. Error	Pashtun* Treatment	Std. Error	East* Treatment	Std. Error	N	R-squared
A. Income, Consumption, and Employment								
Ln(Annual Household Income)	0.056**	[0.022]	-0.109**	[0.050]	0.032	[0.031]	4,578	0.15
Ln(Annual Household Consumption)	0.017	[0.022]	-0.051	[0.042]	0.017	[0.036]	4,315	0.22
Male Respondent is Unemployed	0.008	[0.008]	-0.01	[0.015]	-0.027**	[0.011]	4,621	0.08
Male Respondent is Employed in Subsistence Agriculture and Husbandry	-0.044***	[0.016]	0.047	[0.033]	0.037	[0.038]	4,621	0.16
Summary Index	0.044***	[0.014]	-0.070**	[0.030]	-0.007	[0.026]	4,665	0.18
B. Perceptions of Economic Situation by Male Respondents								
Respondent Perceives Household's Situation Has Improved in the Past Year	0.038**	[0.017]	0.022	[0.027]	0.022	[0.033]	4,662	0.21
Respondent Expects Economic Welfare of Villagers to Improve Next Year	0.046***	[0.014]	0.026	[0.031]	0.001	[0.029]	4,633	0.11
C. Perceptions of Economic Situation by Female Respondents								
Respondent Perceives Household's Situation Has Improved in the Past Year	0.038**	[0.017]	0.019	[0.040]	0.085***	[0.028]	4,227	0.23
Respondent Expects Economic Welfare of Villagers to Improve Next Year	0.051***	[0.018]	-0.031	[0.034]	0.015	[0.037]	4,213	0.18
D. Migration according to village leaders								
Net Number of Families Migrating to the Village	2.75	[1.917]	-5.11	[3.593]	26.977*	[14.821]	460	0.66
E. Perceptions of Government, Civil Society, and ISAF Soldiers by Male Respondents								
District Governor Acts For the Benefit of All Villagers	0.057***	[0.017]	0.015	[0.027]	-0.014	[0.047]	4,414	0.28
Provincial Governor Acts For the Benefit of All Villagers	0.081***	[0.018]	-0.014	[0.027]	-0.119***	[0.039]	4,148	0.26
Central Government Officials Act For the Benefit of All Villagers	0.061***	[0.018]	0.000	[0.031]	-0.080**	[0.037]	4,256	0.22
President of Afghanistan Act For the Benefit of All Villagers	0.070***	[0.015]	-0.045*	[0.024]	-0.110***	[0.025]	4,490	0.22
Members of Parliament Act For the Benefit of All Villagers	0.090***	[0.017]	-0.04	[0.033]	-0.110***	[0.037]	4,409	0.24
Government Judges Act For the Benefit of All Villagers	0.077***	[0.018]	-0.053	[0.043]	-0.081**	[0.041]	4,491	0.20
National Police Act For the Benefit of All Villagers	0.033**	[0.016]	0.02	[0.029]	-0.124***	[0.036]	4,556	0.22
NGO Employees Act For the Benefit of All Villagers	0.058***	[0.016]	0.017	[0.032]	-0.092**	[0.038]	4,472	0.17
ISAF Soldiers Act For the Benefit of All Villagers	0.055***	[0.017]	-0.051	[0.042]	-0.043*	[0.024]	4,062	0.18
Summary Measure	0.134***	[0.026]	-0.024	[0.050]	-0.183***	[0.051]	4,660	0.28

Variable	Treatment Effect	Std. Error	Pashtun* Treatment	Std. Error	East* Treatment	Std. Error	N	R-squared
F. Security Perception by Male Respondents								
Respondent Believes Security In and Around Village Has Improved in Past Two Years	0.053***	[0.019]	0.017	[0.032]	-0.038	[0.034]	4,661	0.28
Respondent Believes Security In and Around Village Has Deteriorated in Past Two Years	-0.024**	[0.012]	-0.007	[0.022]	0.039*	[0.022]	4,661	0.22
Summary Measure	0.091***	[0.033]	0.028	[0.056]	-0.099*	[0.055]	4,661	0.29
G. Security Perception by Female Respondents								
Respondent Believes that compared to two years ago women feel more safe in working for NGOs or the government or attending training courses	0.060***	[0.022]	-0.04	[0.038]	-0.066*	[0.039]	4,063	0.29
Respondent Believes that compared to two years ago women feel less safe in working for NGOs or the government or attending training courses	-0.063***	[0.016]	0.084**	[0.041]	0.037	[0.032]	4,063	0.33
Respondent Believes that compared to two years ago teenage girls feel more safe when traveling to and from school or when socializing with other girls	0.046**	[0.021]	-0.01	[0.040]	-0.071	[0.044]	4,020	0.27
Respondent Believes that compared to two years ago teenage girls feel less safe when traveling to and from school or when socializing with other girls	-0.058***	[0.017]	0.073	[0.046]	0.03	[0.055]	4,020	0.31
Summary Measure	0.132***	[0.034]	-0.116	[0.087]	-0.119**	[0.059]	4,102	0.29
H. Security Experience According to Male Respondents								
Village Has Experienced Attack in Past 12 Months	-0.01	[0.011]	0.027	[0.021]	0.000	[0.016]	4,661	0.33
Village Has Experienced Attack by Anti-Government Elements in the Past Year	-0.012	[0.010]	0.035**	[0.015]	0.001	[0.016]	4,664	0.34
Respondent Household Has Been Affected by Insecurity in Village During the Past Year	-0.001	[0.007]	0.012	[0.012]	0.001	[0.007]	4,660	0.27
Respondent Household Has Been Affected by Insecurity on Roads Around District During the Past Year	0.007	[0.005]	-0.014	[0.010]	-0.007	[0.005]	4,660	0.12
Summary Measure	0.019	[0.040]	-0.084	[0.066]	0.01	[0.050]	4,666	0.34
I. ISAF data on security incidents								
Security incident within 1 km, short run[12]	0.000	[.]	-0.020	[0.027]	0.000	[.]	500	0.50
Security incident within 1 km, long run	-0.006	[0.006]	-0.014	[0.067]	-0.114*	[0.066]	500	0.58
Security incident within 3 km, short run	-0.011	[0.016]	0.011	[0.074]	0.011	[0.016]	500	0.61
Security incident within 3 km, long run	0.006	[0.010]	0.154	[0.105]	-0.206**	[0.086]	500	0.76
Security incident within 10 km, short run	-0.029	[0.022]	-0.051	[0.083]	0.069	[0.092]	500	0.81
Security incident within 10 km, long run	-0.040	[0.025]	0.020	[0.068]	-0.040	[0.108]	500	0.85

[12] All security incidents within 1 kilometer around evaluation villages in the sort-run occurred near villages from eastern districts, so that the coefficients for Treatment and Treatment*East cannot be identified.